<u>IN THE CLAIMS</u>

Please cancel claims 1-18 without prejudice. Claims 19-36 are new.

Please amend the following of the claims which are pending in the present application:

1.-18. (Cancelled)

19. (New) A method for generating a uniform plasma, the method comprising:

a. introducing a process gas into a plasma reactor;

b. introducing an RF antenna having a first unidirectional oscillating current in a first direction and a second unidirectional oscillating current in a second direction inside the plasma reactor; and

c. the first unidirectional oscillating RF current sheet is substantially perpendicular to the second unidirectional oscillating current sheet wherein the unidirectional oscillating RF currents are oscillating at a frequency range of 300 to 1000 kHz.

20. (New) The method in accordance with claim 19, further wherein the RF antenna having first and second unidirectional oscillating currents generate a time varying RF electrical field azimuthally shifted on 45° with respect to the first and second direction of the first and second unidirectional oscillating RF currents.

21. (New) The method in accordance with claim 19, wherein the process gas comprises: argon, nitrogen, methane, or hydrogen or a combination of any of the mentioned gases.

22. (New) The method in accordance with claim 19, wherein the first and second unidirectional oscillating RF currents exhibit substantially no phase differences.

23. (New) A method for generating a uniform plasma, the method comprising:

a. introducing a process gas into a plasma reactor:

b. introducing a unidirectional oscillating RF current into a first plurality of current carrying conductors in a first direction and a second plurality of current carrying conductors in a second direction;

c. generating a time varying RF electrical field azimuthally shifted with respect to the first and second direction of the unidirectional oscillating RF currents; and

d. the unidirectional oscillating RF current in the first and second plurality of current carrying conductors exhibit substantially no phase differences;

wherein the unidirectional oscillating RF current is oscillating at a frequency range of 300 to 1000 kHz.

24. (New) The method in accordance with claim 23, wherein the process gas comprises: argon, nitrogen, methane, or hydrogen or a combination of any of the mentioned gases.

25. (New) A method for generating a uniform plasma, the method comprising:

a. introducing a process gas into a plasma reactor:

b. introducing a first unidirectional oscillating RF current into a first plurality of current carrying conductors in a first direction;

c. introducing a second unidirectional oscillating RF current into a second plurality of current carrying conductors in a second direction;

d. generating a time varying RF electrical field azimuthally shifted with respect to the first and second direction of the first and second unidirectional oscillating RF currents; and

e. the first and second unidirectional oscillating RF currents exhibit substantially no phase differences;

wherein the first and second unidirectional oscillating RF currents are oscillating at a frequency range of 300 to 1000 kHz.

26. (New) The method in accordance with claim 25, wherein the process gas comprises: argon, nitrogen, methane, or hydrogen or a combination of any of the mentioned gases.

27. (New) A method for generating a uniform plasma, the method comprising:

a. introducing a process gas into a plasma reactor;

b. introducing a unidirectional oscillating RF current into a first plurality of current carrying conductors in a first direction;

c. introducing the unidirectional oscillating RF current into a second plurality of current carrying conductors in a second direction;

d. generating a time varying RF electrical field azimuthally shifted with respect to the first and second direction of the unidirectional oscillating RF currents; and

e. the unidirectional oscillating RF current in the first and second plurality of current carrying conductors exhibit substantially no phase differences;

wherein the unidirectional oscillating RF current is oscillating at a frequency range of 300 to 1000 kHz.

28. (New) The method in accordance with claim 27, wherein the process gas comprises: argon, nitrogen, methane, or hydrogen or a combination of any of the mentioned gases.

29. (New) An antenna arrangement for an inductively coupled plasma reactor comprising:

a first plurality of substantially parallel current carrying conductors oriented in a first direction;

a second plurality of substantially parallel current carrying conductors oriented in a second direction;

the first and second current carrying conductors for carrying unidirectional oscillating RF currents in a first and second direction respectively;

the first direction being substantially perpendicular to the second direction;

the first plurality of substantially parallel current carrying conductors is disposed planarly above the second plurality of substantially parallel current carrying conductors; and

wherein the unidirectional oscillating RF current is oscillating at a frequency range of 300 to 1000 kHz.

30. (New) The antenna arrangement in accordance with claim 29, wherein the first and second plurality of substantially parallel current carrying conductors adapted to generate a time varying RF electrical field azimuthally shifted on 45° with respect to the first and second direction.

31. (New) The antenna arrangement in accordance with claim 29, wherein the first plurality of substantially parallel current carrying conductors are alternately electrically coupled to the second plurality of substantially parallel current carrying conductors.

32. (New) The antenna arrangement in accordance with claim 31, wherein at least one capacitor is connected between a predetermined number of the first plurality of substantially parallel current carrying conductors and a predetermined number of the second plurality of substantially parallel current carrying for minimizing reactance.

33. (New) A plasma reactor comprising:

a. a plasma reactor chamber adapted for plasma processing and for introducing of a process gas; and

b. an RF antenna arrangement comprising a first plurality of substantially parallel current carrying conductors in a first direction;

c. a second plurality of substantially parallel current carrying conductors in a second direction;

d. the first and second plurality of current carrying conductors for carrying unidirectional oscillating RF currents in a first and second direction respectively; and the first direction being substantially perpendicular to the second direction; and

e. the first plurality of substantially parallel current carrying conductors is disposed planarly above the second plurality of substantially parallel current carrying conductors;

wherein the unidirectional oscillating RF current is oscillating at a frequency range of 300 to 1000 kHz.

34. (New) The inductively coupled plasma reactor in accordance with claim 33, wherein the first and second plurality of substantially parallel current carrying conductors are disposed inside the plasma reactor chamber.

35. (New) The inductively coupled plasma reactor in accordance with claim 33, wherein each of the first and second plurality of substantially parallel current carrying conductors is contained inside each of a plurality of dielectric sleeves.

36. (New) The inductively coupled plasma reactor in accordance with claim 35, wherein the plasma reactor chamber is adapted to accommodate the plurality of dielectric sleeves and still maintain vacuum integrity of the plasma reactor chamber.